What is claimed is:

1. An optical amplifier comprising

An optical signal input for receiving an input optical signal to be amplified;

A pumping laser input for receiving a pumping laser input signal for use in amplifying the input optical signal;

Means for measuring a power of the pumping laser input signal;

A combiner for combining the pumping laser input signal and the input optical signal;

An EDFA having an input coupled to the output of the combiner and an output coupled to a splitter, the splitter dividing out a portion of the signal output from the EDFA and attributable to a pump residual power of the pumping laser after amplification by the EDFA;

Means for measuring the pump residual power; and

Feedback means for adjusting a current of the pumping laser using the residual power and the pumping laser input signal power.

2. The optical amplifier of claim 1 further comprising a pumping laser having a first frequency and coupled to the pumping laser input.

3. The optical amplifier of claim 1 wherein the means for measuring a power is a photodiode.

4. The optical amplifier of claim 1 further comprising a gain flattening filter (GFF) coupled to an output of the splitter for receiving and filtering a remainder signal attributable to an amplified input signal received from the splitter and providing a flattened output signal.

5. The optical amplifier of claim 4 further comprising a variable optical attenuator coupled to the output of the GFF for variably adjusting a received signal to achieve constant power output.

6. The optical amplifier of claim 1 wherein the combiner is a wave division multiplexing (WDM) combiner.

7. The optical amplifier of claim 6 wherein the WDM combiner combines an input signal of substantially 1550 NM with a pumping laser input of substantially 980 NM.

8. The optical amplifier of claim 1 wherein the splitter is a wave division multiplexing (WDM) splitter.

9. The optical amplifier of claim 1 wherein the WDM splitter splits an output of the EDFA into a first signal having a first frequency and a second signal having a second frequency, where the first signal has a frequency that is substantially 1550 NM and the second frequency is substantially 980 NM.

10. The optical amplifier of claim 1 wherein the WDM splitter splits an output of the EDFA into a first signal having a first frequency and associated with an amplified version of the input signal and a second signal having a second frequency and associated with the pumping laser signal

11. An optical amplifier comprising

An optical signal input for receiving an input optical signal to be amplified;

A pumping source input for receiving a pumping source input signal for use in amplifying the input optical signal;

A combiner for combining the pumping source input signal and the input optical signal;

An EDFA having an input coupled to the output of the combiner and an output coupled to a splitter, the splitter dividing out a portion of the signal output from the EDFA and attributable to a pump residual of the pumping laser after amplification by the EDFA;

Error correction means for measuring the pump residual and adjusting the pumping input signal provided by the pumping source.

12. The optical amplifier of claim 11 further comprising a pumping laser having a first frequency and coupled to the pumping source input.

13. The optical amplifier of claim 11 wherein the error correction means includes a photodiode for measuring a power of a pump residual.

14. The optical amplifier of claim 11 further comprising a gain flattening filter (GFF) coupled to an output of the splitter for receiving and filtering a remainder signal attributable to an amplified input signal received from the splitter and providing a flattened output signal.

15. The optical amplifier of claim 14 further comprising a variable optical attenuator coupled to the output of the GFF for variably adjusting a received signal to achieve constant power output.

16. The optical amplifier of claim 11 wherein the combiner is a wave division multiplexing (WDM) combiner.

17. The optical amplifier of claim 16 wherein the WDM combiner combines an input signal of substantially 1550 NM with a pumping source input of substantially 980 NM.

18. The optical amplifier of claim 11 wherein the splitter is a wave division multiplexing (WDM) splitter.

19. The optical amplifier of claim 11 wherein the WDM splitter splits an output of the EDFA into a first signal having a first frequency and a second signal having a second frequency, where the first signal has a frequency that is substantially 1550 NM and the second frequency is substantially 980 NM.

20. The optical amplifier of claim 11 wherein the WDM splitter splits an output of the EDFA into a first signal having a first frequency and associated with an amplified version of the input

signal and a second signal having a second frequency and associated with the pumping source signal.

21. An optical amplifier comprising:

An optical signal input for receiving an input optical signal to be amplified;

A pumping source input for receiving a pumping source input signal for use in amplifying the input optical signal;

An EDFA operable to use the pumping source input signal to amplify the input optical signal producing an output optical signal; and

An error correction controller for measuring the pump residual and adjusting the pumping input signal provided by the pumping source.

22. A method for amplifying an optical signal using an EDFA, comprising

Amplifying an input signal using an EDFA producing an amplified output signal; and

Measuring a pump residual power component of the amplified output signal and using the measured pump residual power component to adjust a performance of the EDFA.